

ABSTRACT OF THE INVENTION

A system and method for optimizing liquid-handling parameters for liquid-handling instruments based on automated use of Design of Experiments principles. An automated factor screening experiment generates a fractional factorial design, creates a set of liquid classes, directs a pipetting control program to execute a worklist of pipetting commands, and performs an effects analysis to determine the factors affecting pipetting precision. An automated response surface methodology experiment based on a central composite experimental design is used to determine the optimal level of factors affecting precision of pipetting. An automated range-finding experiment determines the useful volume range of the liquid class so developed. An automated accuracy calibration experiment generates a calibration coefficient for the liquid class. An automated liquid class verification experiment then evaluates the precision and accuracy of the liquid class.